

A receptor-binding domain-based nanoparticle vaccine elicits durable neutralizing antibody responses against SARS-CoV-2 and variants of concern

ASD254 is a COVID-19 nanoparticle vaccine jointly developed by Dr. Mi-Hua Tao's research group in the Institute of Biomedical Sciences at Academia Sinica and Ascendo Biotechnology. This vaccine uses the receptor-binding domain (RBD) of the spike protein, which composes most of the immune-dominant epitopes for inducing neutralizing antibodies, as antigen and utilizes ASD25x nanoparticle vaccine platform to enhance its immunogenicity.

As compared with the aluminum-adjutant RBD vaccine, ASD254 induced higher titers of RBD-specific antibodies and generated 10- to 30-fold more neutralizing antibodies. Mice vaccinated with ASD254 showed protective immune responses against SARS-CoV-2 challenge, with undetectable infectious viral loads and reduced typical lesions in lung. Also, the neutralizing antibodies in vaccinated mice were durable for at least 1 year and effective against SARS-CoV-2 variants of concern, including B.1.1.7 (Alpha), B.1.351 (Beta), P.1 (Gamma), B.1.617.2 (Delta), and B.1.1.529 (Omicron). ASD254 induces potent immune responses without the need for additional adjuvants and the raw materials are simple and easy to control. Moreover, it is quite stable and can be stored at refrigerated temperature for a long time. These advantages make ASD254 a potential next-generation vaccine to combat COVID-19 pandemic.

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